43.1 General Discussion

On all Federal Highway Administration (FHWA) funded transportation projects, local agencies must document location and design approval prior to preparation of plans, specifications, and estimates (PS&E).

As explained in Chapter 13, Becoming Certified, when an agency operates under Certification Acceptance (Chapter 13), the approving authority for design is the local agency. The Assistant Secretary for Highways and Local Programs may delegate responsibilities for project administration to the Region Local Programs Engineer on a case-by-case basis.

A project design shall not be approved until the project's environmental considerations have been approved by FHWA, and its public hearing requirements have been met.

For all but the largest and most complex projects, the Project Prospectus serves as the Location and Design Report and approval. Where the prospectus adequately covers the items required for design approval, the local agency may approve the design using the prospectus in lieu of a Design Report.

For projects on managed access state highways within the incorporated limits of cities and towns, *City and County Design Standards* apply to areas outside the curb or outside the paved shoulder where no curb exists. WSDOT design requirements apply to the curbs and the entire area between the curbs (including raised medians), or between the outside edges of paved shoulder where no curb exists.

For high cost and major projects, a value engineering study should be performed and the results or summary included in the Design Report.

When there is a subsequent change to the project design or scope, an amended location-design approval is required.

43.2 Requirements for Design Approval

The items listed below, required for design approval, are normally included in the Project Prospectus. If the project is very large or complex (see Section 43.44), the local agency should prepare a separate Design Report that discusses project objectives, design criteria, and alternatives in greater depth than is possible in a prospectus. Examples of Design Reports and assistance in preparing them may be obtained from the Region Local Programs Engineer. This guidance is provided especially for those CA agencies that only have occasional FHWA funded projects.

.21 Traffic Data. Design-year ADT, the average daily traffic forecast during the design year should be included. The design year may be any point within 8 to 20 years from the projected start of construction.

.22 Right-of-Way. Refer to Chapter 25, Right-of-Way Procedures.

.23 Horizontal-Vertical Alignment. A plan showing the proposed horizontal alignment, existing streets, and proposed intersections shall be included. Show only sufficient detail to generally portray the scope of the project. If there is little change in the profile, do not include a profile. If there is significant change, furnish a profile showing existing and recommended vertical alignments.

.24 Roadway Section. Provide typical roadway sections for each general type of roadway in the project. This is not required on signal projects if the lane description has been shown.

.25 Pavement Design Criteria. Rationale for selection of the pavement type and depth of surfacing.

.26 Cost Estimate. The costs submitted shall be included for the Project Prospectus and the Local Agency Agreement shall be used.

.27 Environmental Considerations. Documentation, including approval by FHWA.

.28 Hearing Data. Reviewing the above documentation, the local agency will determine whether the design is in conformance with all requirements. If the design is in conformance, if the necessary environmental actions (Chapter 24) have been completed and approved by FHWA, and if public hearing requirements have been met, the local agency will grant and publish design approval (see Appendixes 43.71 and 43.72).

.29 Permits. Refer to Chapter 24, Federal Environmental Process, and Appendix 44.78 for a sample list of permits that may be required.

43.3 Bridge Design Approval

.31 Policy.

a. The bridge site data should be prepared in conjunction with the Design Report. Extensive structural studies and the preparation of the bridge preliminary plans during the Design Report phase is not recommended. Expected changes to the roadway geometrics, project staging, construction costs, and other conceptual data will affect the structure and, therefore, impact the structural design effort.

b. For bridge projects that do not fall under categories described in c. or d. below, the local agency is the approving authority for location design.

c. For bridge projects that fall under the category of "major or unusual," the Assistant Secretary for Highways and Local Programs approval is required at the preliminary "Type, Size, and Location" (TS&L) stage. (The FHWA regulatory requirements for large or unusual bridges contained in the *Federal Aid Policy Guide* (FAPG) also apply to large or unusual structures, tunnels, or hydraulic facilities. The definitions and requirements for major or unusual bridges will be addressed below; for other cases, refer to the FAPG.)

d. For bridge projects on state routes and for any local agency bridge project that will be advertised and awarded by the Washington State Department of Transportation (WSDOT), design approval by the Assistant Secretary for Highways and Local Programs is required.

.32 Definitions. A "major bridge" is a bridge estimated to cost more than $5 million. This criterion applies to individual units of separated dual bridges. An "unusual bridge" is a bridge involving difficult or unusual foundation problems, new or complex designs with unusual structures or operational features, or a bridge for which the design standards or criteria might be questionable.

.33 Submittal of Data. Refer to Section 34.42.

The Assistant Secretary for Highways and Local Programs approval of TS&L is required for major or unusual bridges before the local agency may approve the design and before the local agency may begin preparing the final PS&E.

.34 Bridges on State Right of Way. Bridge projects designed and constructed by a local agency within state right-of-way are to have a WSDOT representative assigned by the Region Administrator to serve as the Project Coordinator and WSDOT contact for all aspects of the project. This person is to assist in reviews by the Bridge Office and others and to ensure that adequate coordination between the local agency, region, and service center offices take place at each appropriate stage.

All pertinent review data submitted to the local agency by the Bridge Office concerning constructability, safety, aesthetics, or use of the bridge by the motoring public will be forwarded to the local agency through the Project Coordinator with a copy to the Highways and Local Programs Operations Engineer.

Local agencies, WSDOT, the Bridge Office, and other appropriate WSDOT representatives are to hold an early coordination meeting. Members present are to agree upon a list of key expectations and milestones that include but are not limited to: pre-scoping prior to consultant selection, design report review, prospectus stage, agreed upon periodic stage reviews of bridge plans, aesthetics, and selection of structure type. The WSDOT Project Coordinator is to ensure that all members reach agreement on the milestones and then collectively adjust or adhere to them.

43.4 Value Engineering

.41 Definition. Value Engineering (VE) is the systematic application of recognized techniques, by multidisciplined team(s). These techniques are:

- identify a product's function or service;
- establish a function's monetary value or worth;
- provide alternate ways, using creative techniques, to reliably accomplish necessary functions in the most effective and efficient manner.

Reducing the scope of a project, compromising the performance of an element, or simply substituting cheaper materials is not VE. VE is not just "good engineering." It simply answers the question, "What else will accomplish the purpose of the product, service, or process we are studying?" All costs are taken into account over the entire life of the project.

.42 Authority for VE. Paragraph 4b of DOT Order 1395.1 Use of Value Engineering (VE) by the U.S. Department of Transportation, dated April 13, 1987, provides: "All DOT grant awards for major transportation projects should strongly encourage the use of VE in the planning, design, and/or construction phases. This may include the use of VE incentive clauses in construction contracts."

.43 Why VE is Needed. The costs of highway needs far exceed the funds available for improvements. As the cost of highway construction increases, more emphasis is being placed on the maintenance and rehabilitation of existing facilities to maximize these available funds.

VE is a tool that can counteract these growing problems by providing (1) cost reduction, (2) product or process improvement, and (3) alternative means and materials for highway construction and maintenance.

.44 VE Application (General). VE may be applied at any point in highway development, operation, and maintenance. For maximum effectiveness, however, VE should be undertaken as early as possible (during the first 30 percent of design) when decisions on life-cycle costs are being made and valid project development recommendations can be implemented. When a complex, costly project is selected as a candidate for potential cost reductions, investigations should start as soon as a preliminary estimate is in hand.

VE should be employed when the ratio of potential savings to the cost of the VE study is significant. VE can also be used in evaluating standard details that are used repetitively on many projects. The cost of VE studies in preconstruction activities may be allocated to the preliminary engineering cost of the related project.

Local agencies are also encouraged to include a VE incentive clause in their construction specifications; such clauses encourage contractors to propose changes to the contract that fulfill a project's function requirements at less cost.

It is recommended that the local agency staff prepare a "VE Assessment Report" (Appendix 43.73) for all projects exceeding $2 million in total cost, or any other project determined by the staff to warrant a report. The report will address the project characteristics, cost per kilometer, potential savings of high cost items, and other considerations unique to the project. From this assessment, a recommendation will be developed as to whether a VE study is needed. If the local agency decides that a VE study should not be performed, the reasons should be documented.

When the local agency determines that a VE study should be performed, they should use the references listed in Section 43.48. The study results of the VE team should be included in the design report submitted to the Regional Highways and Local Programs Engineer along with the agency's recommended alternative.

When an alternative is acceptable to the local agency and WSDOT, the local agency submits a project prospectus to the Regional Highways and Local Programs Engineer. The project then proceeds as defined in this manual.

.45 VE Application (Bridge Projects)

a. Selection Process for VE Study. After the Bridge Replacement Advisory Committee (BRAC) recommends bridge projects for funding, a review of possible strategies (closure, repair, rehabilitation, or replacement) is done for those bridges identified for C3R review discussed in Chapter 34. This begins the process for identifying bridge projects for which a formal VE study may be desirable in order to define cost-effective alternate designs.

   C3R review findings will be reviewed by the Highways and Local Programs Operations Engineer in coordination with the local agency and the Regional Highways and Local Programs Engineer. Based on these findings, the Highways and Local Programs Operations Engineer will recommend to the Assistant Secretary for Highways and Local Programs whether a VE study should be undertaken.

   The Assistant Secretary for Highways and Local Programs makes the final decision in consultation with the local agency.

.46 VE Coordinator. When the decision is made to proceed with a VE Team analysis, the Highways and Local Programs Operations Engineer will be the VE Coordinator.

The VE Coordinator will:

a. Inform the local agency in writing that a VE Study Team is being formed.

b. Reach agreement with the local agency on the time and place for the study. Select the VE Team Facilitator and the other members of the VE Team.

c. Request that the local agency provide the typical project related information, the name of the local agency's VE Team member, and the name of a local agency contact person (not the VE Team member) who will be responsible for providing facility and equipment related items required by the VE Team. The local agency team member should be an unbiased representative who would normally have no direct involvement in the project.

.47 VE Study Team. The VE Study Team will be headed by a qualified facilitator not employed by the local agency. The duties and responsibilities of the facilitator will include, but are not limited to, the following:

a. Acts as chairperson at meetings of the VE Team.

b. Presents the findings and recommendations of the VE study to the local agency management and other interested agencies.

c. Provides the final VE Study Report to the local agency and the WSDOT Assistant Secretary for Highways and Local Programs.

The VE Team will be comprised of five (5) members including the facilitator. One team member should have a background in bridge design or construction. If environmental factors are part of the study process, then the team should also include a member who has expertise on environmental issues. All VE Team charges will be billed to the local agency.

The VE Team will formally present their study results to local agency representatives, WSDOT Highways and Local Programs, and all other interested persons. Team findings and recommendations will then be documented in a formal report and sent to the local agency as soon as possible. Courtesy copies are sent to other appropriate agencies and individuals.

The local agency will evaluate the VE Team recommendations. Should their preferred alternative differ from the prospectus or if no project prospectus has been approved, the local agency submits a new or revised prospectus for their preferred alternative to the Regional Highways and Local Programs Engineer. A summary of the VE study results should be included in this transmittal as reference material. The project then proceeds as defined in this manual.

.48 Reference Materials

- *Value Engineering Guide for Cities and Counties*, Kempter-Rossman International.
- *Operating Tip — Value Engineering*, NWT^2 Center, October 1985.
- *Value Engineering Contract Provisions on Federal Aid Highway Construction Projects*, Report No. 75-84-217, FHWA, December 1984.

- *Pavement and Shoulder Maintenance Performance Guide*, Report No. TS-84-208, FHWA, August 1984 (Developed in conjunction with Arkansas, Colorado, Iowa, New Mexico, North Dakota, South Dakota, Utah, and Washington).
- *Value Engineering for Highways*, prepared for FHWA by Kempler-Rossman International, revised October 1983.
- *Value Engineering Conference Summary Report*, Report No. TS-80-246, FHWA, August 7, 1980.
- *Value Engineering — A Systematic Approach*, Arthur E. Mudge, McGraw-Hill, New York, 1971.
- *Value Engineering in the Construction Industry*, Alphonse J. Dell'isola, Construction Publishing Co., Inc., New York, 1974.
- *Guidelines for Value Engineering (VE)*, subcommittee on New Highway Materials, AASHTO-AGC-ARTBA Joint Cooperative Committee. Reprinted by USDOT/ FHWA February 1983.

43.5 Additional Data Required for Special Projects

.51 Traffic Signal Projects. The local agency shall provide warrants for signalization in accordance with Part 4c of the *Manual on Uniform Traffic Control Devices* (MUTCD). Designs for signalization at intersections with state routes require review by WSDOT. A signal permit is required for all traffic signals on state routes. An early application to the WSDOT Regional Administrator is advisable.

.52 Projects Involving State Routes. Designs for all projects involving state routes shall be submitted to the Regional Highways and Local Programs Engineer for approval. All work at intersections with state routes requires submittal of an intersection plan to the Regional Highways and Local Programs Engineer for approval. Prints of existing intersection plans are available from WSDOT. Revisions should be shown on these prints.

43.6 Design Approval Notices

If hearings are held or if the opportunity for a hearing has been afforded, the local agency will publish a notice of design approval. The notice is published after the hearing has been held (or the opportunity offered) and after the design has been developed and approved. Its purpose is to inform interested parties of action taken in response to their comments or concerns.

The notice is published in the same manner as the hearing notice and should include the following:

a. A description of the location or design.

b. A map or sketch of the area involved.

c. A statement announcing that maps, sketches, and other supporting documentation are available to the public at a convenient location.

43.7 Appendixes

_____
_____
_____
_____

_____
_____
_____
_____

Gentlemen:

Please publish one time only the attached Notice of Approval of Location and Design for the project referenced above.

It is further requested that you send to this office three (3) copies of an affidavit of publication, together with your billing in triplicate.

Please mail the affidavits and invoices to:

(Address of Approving Authority)

Very truly yours,

_____
Approving Authority

Attachment

Sample FHWA Project Notice of Approval of Location and Design

The (Agency Name) does advise that the (Approving Authority on CA Agreement) has approved the following described Location and Design on _____ in _____ Agency.

The project _____ (Termini)

The proposed project provides for

All maps and data concerning this project are available for public inspection at the office of the _____ Agency Engineer, _____, Washington.

This notice is in conformance with Federal Aid Highway Act, 23 U.S.C. 101 et. seq., 128, 315, section 2(a), 2(b)(2), and 9(e)(1) of the Department of Transportation Act, 49 U.S.C. 1651(a) and (a)(2), 1657(e)(1); 49 CFR SS 1.4(c); and 23 CFR SS 1.32.

_____
Approving Authority

Agency: _____ Date: _____

Project: _____ Project #: _____

Project Limits: _____

Reviewing Team: _____

Project Characteristics

Length: _____ Cost: $_____ Cost/Unit Length: $_____

Major structure (Y/N)	____	Includes items that have questionable, complex, or costly function (Y/N)	____
Extensive R/W (Y/N)	____		
Complex project (Y/N)	____	Includes items difficult to construct (Y/N)	____
Includes items that appear too costly (Y/N)	____	Complicated or costly traffic control or detours (Y/N)	____
Includes critical or expensive materials (Y/N)	____		

Horizontal Alignment: _____

_____

_____

Vertical Alignment: _____

_____

Materials Source: _____

_____

Design Concept: _____

_____

Other Considerations: _____

_____

_____

_____

Other Alternatives Considered: _____

_____

_____

_____

Major High Cost Items and Potential Cost Saving Ideas	Cost	Potential Savings
(1) _____	$_____	$_____
(2) _____	$_____	$_____
(3) _____	$_____	$_____

Conclusions and Recommendations: _____

_____

_____

Approving Authority Recommendations: _____

_____

_____